

REMARKS

Claims 1-31 are pending. Claims 1-31 have been amended. No new matter has been introduced. Reexamination and reconsideration of the application are respectfully requested.

In the October 9, 2001 Office Action, the Examiner rejected claims 1-31. The Examiner stated that the Title of the Invention was not descriptive. The Examiner objected to the drawings under 37 C.F.R. § 1.83(a) on the ground that they do not show every feature of the invention as recited by the claims. The Examiner rejected claims 1-31 under 35 U.S.C. § 112, second paragraph, as failing to set forth the subject matter which applicant regards as the invention and failing to particularly point out and distinctly claim the invention. The Examiner rejected claims 1, 2, 6, 10, 14, 18, and 28-31 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,282,654 to Ikeda et al. (the Ikeda reference). The Examiner rejected claims 1, 2, 6, 10, 14, 18, and 28-31 under 35 U.S.C. § 103 as being obvious over the Ikeda reference, further considered with U.S. Patent No. 6,009,058 to Sims, III et al. (the Sims reference), and U.S. Patent No. 5,940,854 to Green, Jr. et al. (the Green reference). The Examiner rejected claims 1, 2, 6, 10, 14, 18, and 28-31 under 35 U.S.C. § 103 as being obvious over the Orange Book standard — IEC — 13490 (as described in U.S. Patent No. 5,940,853 to Ooi et al.) (the Ooi reference) considered with Official Notice with respect to personal computer systems having write abilities (write devices). The Examiner rejected claims 3, 7, 11, 15, and 19 under 35 U.S.C. § 103 as being obvious over the art as applied to claims 1, 5, 10, 14, and 18, and further in view of Official Notice. The Examiner rejected claims 4, 5, 8, 9, 12, 13, 16, 17, 20, and 21 under 35 U.S.C. § 103

as being obvious over the art as applied to claims 1, 5, 10, 14, and 18, and further in view of the Sims reference. The Examiner stated that claims 22 and 25 would be allowable over the art if the 35 U.S.C. § 112, second paragraph, rejection is overcome. These rejections are respectfully traversed.

The present invention relates to a system and method of logically erasing contents of a CD-RW disc in response to an erase command. The CD-RW disc is optically rewriteable, and has a program area and a Program Memory Area (PMA) area. The program area is recorded with the contents in the form of tracks. The PMA area is recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc, and the other kind of frames contains track information for determining the tracks of which the contents are recorded in the program area. In response to the erase command, the PMA area is accessed, and all frames that contain track information are deleted from the PMA area, thereby logically erasing all of the contents from the program area. The frames that contain the identification information in the PMA area are preserved so that the CD-RW disc can be identified during a rewrite, even after all of the contents are logically erased from the program area of the CD-RW disc.

Independent claim 1, as amended, recites:

accessing the PMA area in response to the erase command;
detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area*; and
preserving the frames containing the identification information in the PMA

area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

The Title of the Invention has been amended to more clearly describe the invention to which the claims are directed.

The Examiner contended that the limitations regarding the "ineffective code", now amended as a *code incapable of identifying the CD-RW disc*, and the "effective code", now amended as a *code capable of identifying the CD-RW disc*, as recited in claims 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 23, 24, 26, and 27 is not indicated in the drawings. Applicant respectfully submits that the *code incapable of identifying the CD-RW disc* (formerly the ineffective code) and the *code capable of identifying the CD-RW disc* (formerly the effective code) are clearly presented in, for example, Fig. 18, and discussed in the specification at, for example, page 35, line 6 to page 36, line 11. The value "ID=0" (see Fig. 18, examples I to V), or null data, is one example of an "ineffective code". Some CD-RW drives automatically write identification information utilizing null data forming the "ineffective code" into the PMA area. Conventional drives often allot the null data for use in writing to a disc as a default value in case no identification is requested. Due to this default setting, there may exist many discs having the same null data as the disc ID (e.g., a value of "0"), and an individual disc drive cannot identify such discs. Therefore in this case, the null data is *incapable of identifying the CD-RW disc* (ineffective code). In example VI of Fig. 18, "ID≠0" has a value other than null data (i.e., "0"), and it is *capable of identifying the CD-RW disc* (thereby being an "effective code").

The Examiner also contended that the limitations regarding the detecting of the

five number of frames as recited in independent claims 22 and 25 are not indicated in the drawings. Applicant respectfully submits that, for example, Fig. 12, with reference to the specification at page 29, line 24 to page 30, line 26, and in particular example I, illustrates the five number of frames where the disc ID is recorded (see "ID" in Fig. 12). Moreover, Fig. 14, for example, with reference to the specification starting at page 32, line 6 to page 33, line 17, and in particular example I, illustrates when TOC data for the last track (see "Te" in Fig. 14) and TOC data for the immediately preceding track (see "Te-1" in Fig. 14) are each recorded in five frames of the immediately adjacent section that is inside the section where the disc ID is recorded. Therefore, at least Figs. 12 and 14 illustrate the five number of frames as recited in independent claims 22 and 25. Accordingly, applicant respectfully submits that independent claims 22 and 25 are in condition for allowance.

The Examiner noted that independent claims 1 and 28 failed to positively recite any detection ability. Independent claims 1 and 28 have been amended to include a "detecting" limitation.

The Examiner noted that independent claims 6 and 18 fail to positively recite the detection of what frame that permits any of the subsequent steps to occur. Applicant respectfully submits that independent claim 6, as amended, positively recites the detection of "where the frames containing the identification information are located at a leading section of the PMA area", and where "the frames containing the track information are located in a subsequent section of the PMA area after the leading section". Therefore, as recited in independent claim 6, as amended, the detected frames in question are the "frames containing the identification information" and the

“frames containing the track information”. Likewise, independent claim 18, as amended, positively recites the detection of “where the frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing frames corresponding to the last track”. Therefore, as recited in independent claim 18, as amended, the detected frames in question are the “frames containing the identification information”.

The Examiner noted that the detecting of the five number of frames, as recited in independent claim 22, as to their disclosed location is not found in the claim. Applicant respectfully submits that independent claim 22, as amended, recites that the “five number of frames containing the identification information are located at a section of the PMA area”. Therefore, as recited in independent claim 22, as amended, the frames are located in a section of the PMA area, and the five number of frames are detected within that section of the PMA area.

With respect to claims 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 23, 24, 26, and 27, each of these claims have been amended to address the “ineffective code” and “effective code” limitations recited therein. These claims have been amended so that “ineffective code” now reads *a code incapable of identifying the CD-RW disc*, and “effective code” now reads *a code capable of identifying the CD-RW disc* to more clearly define the invention.

With respect to independent claims 30 and 31, applicant has amended both claims to place them in better form as Beauregard-type claims.

The Ikeda reference is directed to a recording/reproducing system and a recording/reproducing process for adding additional information to information signals,

such as image signals, and recording the resultant signals on a recording medium, and for, in reproduction, picking up the additional information added to the information signals and then performing control for reproduction. This technology is utilized to prohibit unauthorized copying of discs.

The Ikeda reference does not disclose, teach, or suggest the method in independent claim 1, as amended. Unlike in independent claim 1, as amended, the Ikeda reference does not disclose detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.* The Ikeda reference only shows that a duplicate disc is produced by copying all of the content information together with the embedded disc ID. A disc player may detect a discrepancy between its own disc ID of the duplicate disc and the embedded disc ID of the original disc, and the disc player automatically erases the copied content information from the duplicate disc due to unauthorized copying. (Col. 12, lines 1-16.) ✓ ✓

However, the disc ID recognition and copy protection scheme shown in the Ikeda reference does not relate to detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of*

the contents are logically erased from the program area of the CD-RW disc, as recited in independent claim 1, as amended.

The Sims reference does not make up for the deficiencies of the Ikeda reference. The Sims reference is directed to a method of formatting rewriteable compact optical disks. A disk is initially partially formatted for immediate use, and then additional incremental formatting is provided until the disk is completely formatted. The additional formatting may take place while a drive is off-line. In one embodiment, data is written to an unformatted disk with data writing and formatting taking place simultaneously. In various example embodiments, lead-in and lead-out areas may be written first with nothing in between or lead-in and lead-out areas may optionally be written only if needed.

The Sims reference does not disclose, teach, or suggest the method in independent claim 1, as amended. Unlike in independent claim 1, as amended, the Sims reference makes no mention of detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.* The Sims reference shows that a CD-RW disc format may include a frame structure (col. 3, lines 42-61; see Fig. 1B), and it does not relate to detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can*

be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc, as recited in independent claim 1, as amended.

The Green reference does not make up for the deficiencies of the Ikeda reference and the Sims reference. The Green reference is directed to a unique and permanent identifier that is provided for removable media. The identifier is preferably recorded in a previously unused or reserved portion of the media and can be generated from a combination of the originating drive serial number and the current date and time with a random number concatenated thereto. When a piece of media is loaded into a drive, the drive examines the reserved area for the presence of an identifier. If not present, the drive generates and records an identifier before performing whatever disk access operations have been requested. If the identifier is present, the drive is prevented from overwriting the identifier with a new one and the disk access operations are performed immediately. Once the media is provided with its identifier, the media, and any errors associated with the media, can be tracked throughout its life.

The Green reference does not disclose, teach, or suggest the method in independent claim 1, as amended. Unlike in independent claim 1, as amended, the Green reference does not disclose detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.* The Green reference teaches a method of compulsively writing a

permanent ID to an optical disc for tracking the media and any errors associated to the media throughout its life. When a disc drive does not detect an ID in a loaded disc, the drive creates a unique ID and writes the created ID into the PMA area of the disc. When the drive detects an ID from a loaded disc, the drive inhibits rewriting and erasing of the detected ID to thereby permanently maintain the ID for the tracking purpose throughout its life. (Col. 3, line 44 to col. 4, line 13.)

However, the permanent ID retention/tracking scheme of the Sims reference does not teach detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc*, as recited in independent claim 1, as amended.

The Ooi reference does not make up for the deficiencies of the Ikeda reference, the Sims reference, and the Green reference. The Ooi reference is directed to a recording apparatus for recording data and block units together with management information for the block units of data as a track in the recording area of a non-erasable recording medium. The apparatus detects the recording status of the non-erasable recording medium. Based upon the detected recording status, the apparatus reserves a particular part of the track for recording management information. The apparatus records the management information in the reserved recording area.

The Ooi reference does not disclose, teach, or suggest the method in

independent claim 1, as amended. Unlike in independent claim 1, as amended, the Ooi reference makes no mention of detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.* The Ooi reference only discloses that a disc ID may be written into a PMA area of a disc (col. 3, lines 62-67), but it does not teach detecting and *deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area, and preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc,* as recited in independent claim 1, as amended. Accordingly, applicant respectfully submits that independent claim 1, as amended, distinguishes over the above-cited references.

Claims 2-5 all directly depend from independent claim 1, as amended. Independent claims 6, 10, 14, 18, 22, 25, and 28-31, all as amended, each recite limitations similar to independent claim 1, as amended. Claims 7-9 all directly depend from independent claim 6, as amended. Claims 11-13 all directly depend from independent claim 10, as amended. Claims 15-17 all directly depend from independent claim 14, as amended. Claims 19-21 all directly depend from independent claim 18, as amended. Claims 23 and 24 all directly depend from independent claim 22, as amended. Claims 26 and 27 all directly depend from independent claim 25, as

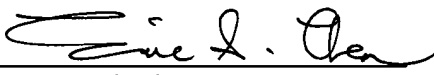
amended. Accordingly, applicant respectfully submits that claims 2-31 also distinguish over the above-cited references for the reasons set forth above with respect to independent claim 1, as amended.

Applicant believes that the foregoing amendments place the application in condition for allowance, and a favorable action is respectfully requested. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call either of the undersigned attorneys at the Los Angeles telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance should the Examiner believe that such a telephone conference would advance prosecution of the application.

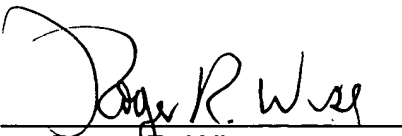
Respectfully submitted,

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APPENDIX

TITLE OF THE INVENTION:

Please amend the Title of the Invention as follows:

METHOD OF LOGICALLY ERASING CONTENTS OF A CD-RW DISC WHILE
[RESERVING] PRESERVING DISC ID [FOR REUSE OF OPC PARAMETER]

IN THE SPECIFICATION:

Please amend the paragraph starting at page 17, line 16 and ending at page 18, line 15 as follows:

ADR = 01 (PMA mode 1) represents TOC data of each track that is recorded in the program area. At this time, "point" represents the number of a musical piece; min, sec and frame represent the end time of the musical piece; and pmin, psec and pfrm represent the start time of the musical piece. The PMA mode 2 data, i.e., the disc ID, are recorded only once (five or ten frames) in the PMA area. Normally, when the CD-RW disc is first loaded into a [DC-RW] CD-RW recording apparatus, the disc ID (PMA mode 2 data) is recorded in all ten frames of the first or leading section in the PMA area (or, the first five frames of the leading section). However, some CD-RW recording apparatus do not record the disc ID in the PMA area, and when a CD-RW disc is first loaded into such a CD-RW recording apparatus to record a track, the disc ID is not recorded at the head of the PMA area; instead, the TOC data (PMA mode 1) for the pertinent tracks are recorded. Then, when the recorded CD-RW disc is loaded into another CD-RW recording apparatus that possesses a function for recording the disc ID, it is detected that the disc ID has not yet been recorded, and at this time, the disc ID

is recorded following the recording end portion of the PMA area. Therefore, in some cases, the disc ID (PMA mode 2 data) is recorded at a location other than the head or leading section of the PMA area. Furthermore, as was previously described, some CD-RW recording apparatus may always record a default code having fixed value (e.g., all 0s) as the disc ID.

IN THE CLAIMS:

Please amend claims 1-31 as follows:

1. (Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames ~~s~~ containing identification information for identifying the CD-RW disc and [the other] another kind of frames ~~s~~ containing track information for indicating the tracks of the contents recorded in the program area, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command;

detecting and deleting all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

[reserving] preserving the frames containing the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof

even after all of the contents are logically erased from the program area of the CD-RW disc.

2. (Amended) The method according to claim 1, wherein the step of [reserving] preserving comprises [reserving] preserving the frames containing the identification information at a predetermined leading section of the PMA area.

3. (Amended) The method according to claim 1, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of [reserving] preserving comprises reserving a ten number of frames which contain the identification information into a predetermined section of the PMA area so as to fill the predetermined section.

4. (Amended) The method according to claim 1, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

5. (Amended) The method according to claim 1, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of

identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

6. (Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and [the other] another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command;

detecting [when] where the frames containing the identification information are located at a leading section of the PMA area and the frames containing the track information are located in a subsequent section of the PMA area after the leading section; then

deleting all of the frames which contain the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

[reserving] preserving the frames which contain the identification information as they are at the leading section of the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

7. (Amended) The method according to claim 6, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of [reserving] preserving comprises reserving a ten number of frames which contain the identification information in the leading section of the PMA area.

8. (Amended) The method according to claim 6, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

9. (Amended) The method according to claim 6, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

10. (Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and [the other] another kind of frames containing track information for indicating the

tracks of the contents recorded in the program area, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command;

detecting [when] where first frames containing the identification information are located at a part of a leading section of the PMA area and [when] where second frames containing the track information are located after the first frames in the PMA area; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

[reserving] preserving the first frames in the leading section of the PMA area while filling the leading section by the first frames to complete the leading section, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

11. (Amended) The method according to claim 10, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of [reserving] preserving comprises reserving a ten number of frames which contain the identification information into the leading section of the PMA area so as to fill the leading section.

12. (Amended) The method according to claim 10, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

13. (Amended) The method according to claim 10, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

14. (Amended) A method of logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being divided into a leading section and subsequent sections and being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and [the other] another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command;

detecting [when] where first frames containing the identification information are located at a subsequent section of the PMA area and [when] where second frames containing the track information are located in either of the leading section and the subsequent sections except for that containing the first frames; then

deleting all of the second frames so as to logically erase all of the contents from the program area; and

[reserving] preserving the first frames in the leading section of the PMA area by copying the first frames from the subsequent [section] sections while deleting the first frames from the subsequent [section] sections, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

15. (Amended) The method according to claim 14, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of [reserving] preserving comprises reserving a ten number of frames which contain the identification information into the leading section of the PMA area so as to fill the leading section.

16. (Amended) The method according to claim 14, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

17. (Amended) The method according to claim 14, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

18. (Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and [the other] another kind of frames containing identification information for identifying the CD-RW disc, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command effective to command an erase of [the] a last track from the program area;

detecting [when] where frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing frames corresponding to the last track; then

deleting the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

[reserving] preserving the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.

19. (Amended) The method according to claim 18, wherein the PMA area is divided into sections by every ten number of frames, and wherein the step of [reserving] preserving comprises reserving a ten number of frames which contain the identification

information into the preceding section of the PMA area so as to fill the preceding section.

20. (Amended) The method according to claim 18, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

21. (Amended) The method according to claim 18, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

22. (Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and [the other] another kind of frames containing identification information for identifying the CD-RW disc, the PMA area being divided into sections by every ten number of frames, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command effective to command an erase of [the] a last track from the program area;

detecting [when] where a five number of frames containing the identification information are located at a section of the PMA area and [when] where another five number of frames corresponding to the last track are located in the [same] section of the PMA area; then

deleting the five number of the frames corresponding to the last track from the section so as to logically erase the contents of the last track from the program area; and

[reserving] preserving a ten number of the frames containing the identification information in the section by duplicating the five number of the frames containing the identification information.

23. (Amended) The method according to claim 22, further comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

24. (Amended) The method according to claim 22, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of

identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

25. (Amended) A method of logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and [the other] another kind of frames containing identification information for identifying the CD-RW disc, the PMA area being divided into sections by every ten number of frames, the method comprising [the steps of]:

accessing [to] the PMA area in response to the erase command effective to command an erase of [the] a last track from the program area;

detecting [when] where a five number of frames corresponding to the last track are located in a preceding section and another five number of frames corresponding to a track next to the last track are located in the [same] preceding section, and a ten number of frames containing the identification information are located at a succeeding section of the PMA area after the preceding section;
then

deleting the five number of the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area;

[reserving] preserving a ten number of the frames corresponding to [the] a track next to the last track in the preceding section by duplicating the five number of the frames corresponding to the track next to the last track; and

[reserving] preserving the ten number of the frames containing the identification information in the succeeding section as they are.

26. (Amended) The method according to claim 25, comprising the step of deleting the frames containing the identification information instead of the step of [reserving] preserving the frames containing the identification information when the identification information is [ineffective] incapable of identifying the CD-RW disc.

27. (Amended) The method according to claim 25, wherein the step of [reserving] preserving comprises detecting when the identification information is composed of [an ineffective code] a code incapable of identifying the CD-RW disc, and then rewriting the identification information from the [ineffective] code incapable of identifying the CD-RW disc to [an effective code] a code capable of identifying the CD-RW disc.

28. (Amended) An apparatus for treating contents of a CD-RW disc, comprising:

a mount that mounts a CD-RW disc which is optically rewriteable and which has a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at

least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and [the other] another kind of frames containing track information for indicating the tracks of the contents recorded in the program area;

an input that inputs an erase command effective to logically erase all of the contents from the program area of the CD-RW disc;

a pickup that accesses [to] the PMA area of the mounted CD-RW disc in response to the erase command; and

a controller that controls the pickup to detect and delete all of the frames which contain the track information from the PMA area, thereby logically erasing all of the contents from the program area, and that controls the pickup to [reserve] preserve the frames which contain the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

29. (Amended) An apparatus for logically erasing contents of a CD-RW disc, comprising:

a mount that mounts the CD-RW disc having a program area and a PMA area, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents

recorded in the program area and [the other] another kind of frames containing identification information for identifying the CD-RW disc;

an input that inputs an erase command effective to command an erase of the last track from the program area;

a pickup that accesses [to] the PMA area in response to the erase command; and

a controller that controls the pickup to perform a process [comprising the steps of] including:

detecting [when] where the frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing the frames corresponding to [the] a last track; then

deleting the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

[reserving] preserving the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.

30. (Amended) A machine readable medium for use in an apparatus having a processor for logically erasing contents of a CD-RW disc in response to an erase command, the CD-RW disc being optically rewriteable and having a program area and a PMA area, the program area being recorded with the contents [in the form of] as

tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing identification information for identifying the CD-RW disc and [the other] another kind of frames containing track information for indicating the tracks of the contents recorded in the program area, [wherein the medium containing program instructions executable by the processor for causing the apparatus to perform a method comprising the steps of] program code stored on the machine readable medium includes instructions to:

[accessing to] access the PMA area in response to the erase command;

[deleting] detect and delete all of the frames containing the track information from the PMA area, thereby logically erasing all of the contents from the program area; and

[reserving] preserve the frames which contain the identification information in the PMA area, so that the CD-RW disc can be identified at rewriting thereof even after all of the contents are logically erased from the program area of the CD-RW disc.

31. (Amended) A machine readable medium for use in an apparatus having a processor for logically erasing contents of a CD-RW disc having a program area and a PMA area in response to an erase command, the program area being recorded with the contents [in the form of] as tracks, the PMA area being recorded with at least two kinds of frames, one kind of frames containing track information for indicating the tracks of the contents recorded in the program area and [the other] another kind of frames containing identification information for identifying the CD-RW disc, [wherein the

medium containing program instructions executable by the processor for causing the apparatus to perform a method comprising the steps of] and program code stored on the machine readable medium includes instructions to:

[accessing to] access the PMA area in response to the erase command effective to command an erase of [the] a last track from the program area;

[detecting when] detect where the frames containing the identification information are located at a succeeding section of the PMA area after a preceding section of the PMA area containing frames corresponding to the last track; then

[deleting] delete the frames corresponding to the last track from the preceding section so as to logically erase the contents of the last track from the program area; and

[reserving] preserve the frames containing the identification information in the preceding section of the PMA area by copying the frames containing the identification information from the succeeding section while deleting the frames containing the identification information from the succeeding section.